which can rather confidently be given. Folk-drama, like other branches of folk-lore, needs studying carefully and minutely to see what its chief essentials are. It is clear that the Church could not repress the dramatic representations of the people. So they utilised them. They turned characters belonging to the primitive religion into characters bearing the names of, and having just the slighest resemblance to, Christian characters. St. George was a knight who fought and slew enemies. He was fitted to do the fighting therefore in these old plays. But he did little else. He had to conform to traditional ways, if he introduced non-traditional speeches. He had to see his slain enemies restored to life, and he had to dress in the traditional manner and meet the traditional animal characters. Except, indeed, for the names of the characters there is nothing in these mumming plays really belonging to Christian knighthood and feudal nobility. No one would dream of attributing to them any of the dignity of romantic chivalry; they remain as they were originally, traditional representations of popular festivals. There is only the rudest action and the most archaic ideas: and it is not difficult, therefore, to get rid of the thin veneer of ecclesiastical influence in order to search for the more archaic relics underneath.

LAURENCE GOMME.

NOTES.

AT a meeting on December 15, Sir W. H. Flower, K.C.B., F.R.S., was elected an Associate of the Royal Academy of Sciences of Belgium.

PROF. G. CAREY FOSTER, F.R.S., will resign the Quain Professorship of Physics, University College, London, at the close of the present session.

DR. AUGUSTUS D. WALLER, F.R.S., Fullerian Professor of Physiology and Comparative Anatomy at the Royal Institution, has resigned his chair.

IT is with deep regret that we announce the death of Prof. T. Jeffery Parker, F.R.S., professor of biology in the University of Otago. Though Prof. Parker died on November 7, the news has only just reached this country; and it is given melancholy interest by the fact that the "Text-Book of Zoology," upon which Prof. Parker had for some time been engaged with Prof. Haswell, was only completed a few days before his death.

THE Council of the Chemical Society have recommended the following as Foreign Members to be balloted for at the next meeting, January 20:—Prof. Remsen, Baltimore, U.S.A.; Prof. Troost, Paris; Prof. Moissan, Paris; Prof. Raoult, Grenoble; Prof. Ostwald, Leipzig; Prof. Curtius, Bonn; Prof. Mensutkin, St. Petersburg; Prof. Markownikow, St. Petersburg; Prof. Arrhenius, Stockholm; Prof. Waage, Christiania; Prof. Franchimont, Leyden; Prof. van der Waals, Amsterdam; Prof. Spring, Liége; Prof. Körner, Milan.

WE regret to learn that Prof. Francesco Brioschi, president of the R. Accademia dei Lincei, died at Milan on December 13.

THE *Athenæum* announces that the mineralogist Dr. Albrecht Schrauf, author of several scientific works—among others of a "Lehrbuch der physikalischen Mineralogie," of a "Handbuch der Edelsteinkunde," and of an "Atlas der Krystallformen,"—has just died at Vienna in his sixtieth year. Dr. Schrauf was professor of mineralogy at the University of that place, and director of the Mineralogical Museum.

THE death is announced, at Cape Colony, of Prof. James Holm, late Professor of Physics at the South African College Cape Town. Prof. Holm (says the *Electrician*) was born in Argyllshire in 1869, and had a brilliant career at Glasgow University, passing on to Edinburgh. Subsequently he spent several sessions in private research, under the special direction of Lord Kelvin, in the physical laboratory of the Glasgow University, and also in the electrical engineering workshops. At the completion of his scholarship he was appointed Demonstrator in Physics at the University College, Nottingham, where he remained until appointed to a professorship at the South African College in 1895.

MR. H. F. DONALDSON, Engineer-in-Chief of the London and India Docks, has been appointed Deputy Director-General of the Ordnance Factories.

THE sub-tropical Botanical Laboratory at Eustis, Florida, has been abandoned, and the work transferred to the Division of Vegetable Physiology and Pathology of the Department of Agriculture, Washington.

MR. A. C. HARMSWORTH has presented his Arctic ship *Windward* to Lieutenant Peary, and will have her overhauled and sent to America for his use in his coming Arctic expedition. This generous act is the latest incident in that series which has shown that England and America are bound by the strongest brotherly ties in their mutual interest in Arctic work.

PROF. OLIVER LODGE will commence his course of six lectures (adapted to a juvenile auditory) upon "The Principles of the Electric Telegraph," at the Royal Institution on Tuesday next, December 28. The subjects of the individual lectures are:—The production of an electric current; detection of an electric current; land telegraphy; ocean telegraphy; principles of wire and cable signalling; space telegraphy.

CHRISTMAS lectures for juveniles are increasing in favour. At University College, Liverpool, Prof. Herdman, F.R.S., will give a course of three lectures and a museum demonstration, on some of the more attractive parts of natural history, during the Christmas holidays. The announcement states that the course is for boys and girls, for whom the best places will be kept; adults will only be admitted on sufferance, should there be room for them.

THE following are among the papers announced for reading at the meetings of the Society of Arts after Christmas, in January and February:—"The Projection of Luminous Objects through Space," by Mr. Eric H. S. Bruce; "Fireproof Construction of Domestic Buildings," by Mr. Thomas Potter; "The Cinematograph," by M. Jules Fuerst.

THE will of the late Dr. George H. Horn (says *Science*) gives his valuable entomological collections, together with his entomological books and instruments and an endowment of 200 dols. per annum, to the American Entomological Society. From the residuary estate, after the death of his sister, the Entomological Society is to receive 5000 dols., the Philadelphia Academy of Natural Sciences 1000 dols., and the American Philosophical Society 500 dols.

AT the recent annual meeting of the Institution of Civil Engineers it was announced that, in respect of papers read during the Session 1896–97, the Council had made the following awards:—The Institution premium, value 10*l.*, to Mr. W. M. Mordey for his paper entitled "Dynamos"; the Paris Electrical Exhibition premium, value 5*l.*, to Mr. John Gavey for his paper on "The Telephone Trunk Line System in Great Britain"; the Fahie premium, value 5*l.*, to Mr. Benest for his paper on "Some Repairs to the South American Company's Cable off Cape Verde in 1893 and 1895." An extra premium of 5*l.* was awarded to Mr. A. P. Trotter for his paper on "The Disturbance of Submarine Cable Working by Electric Tramways." The Council have decided to increase the number and values of the annual premiums commencing with the Session 1897-98 The Willans premium, the value of which the Council e increased to 25*l.*, has been awarded to Mr. Mark Robinson (member) for his paper entitled "On the Recent Development of the Single-Acting High-Speed Engine for Central Station Work."

MR. G. E. BROWN writes upon a proposed memorial to Henry Fox Talbot, in the *British Journal of Photography*. All photographers are aware of the value of Fox Talbot's researches; in fact, modern photography would have no existence but for the labours of the inventor of the calotype process. Yet, as Mr. Brown points out, no mark of appreciation of his services has been made. At Bry-sur-Marne stands a monument to Daguerre; Chalons can show one to Nicephore Népce; but Lacock, in Wiltshire, the home of the Talbots, can display no sign of public gratitude. The memorial proposed is the restoration of the chancel of Lacock Church, where Fox Talbot's father and many of his ancestors, as far back as the sixteenth century, lie buried. It is probable that a more distinctly commemorative character may be given to some definite feature in the chancel, such as a window, but the whole chancel will be commemorative. Subscriptions are invited, and may be sent to the "Fox Talbot Memorial Fund," Capital and Counties Bank, Chippenham.

THE report of the Departmental Committee appointed by the Home Secretary to inquire into the testing of explosives for use in coal mines has just been issued as a Parliamentary paper. It is recommended that explosives be tested in a highly explosive mixture of coal gas and air only, and the Committee feel confident that any explosive which shows itself superior in this mixture would exhibit the same increase in safety in the presence of a coal dust mixture. Taking into account the general results of the experiments, the Committee have drawn up a test, and recommend that this should be applied to all explosives which are submitted for inclusion in the permitted list. The full details of this test are given in an appendix. The amount of the charge which it is proposed to fire will be the equivalent of 2 ozs. of dynamite and of 6 ozs. of gunpowder. In order to pass the test an explosive must not cause more than two failures in forty shots, a failure being defined as either an ignition of the gaseous mixture or an incomplete explosion. After most careful consideration it has been decided to recommend that the test be carried out with a stemming of nine inches of dry powdered clay of good quality well rammed over the charge.

THE Trustees of the British Museum have decided to discontinue the opening of the Exhibition Galleries on week-day evenings from 8 to 10 p.m. after the close of this year; and, instead, to keep them open until 6 p.m. all the year round. The evening opening commenced in February 1890, on the installation of the electric light; the galleries, however, being opened only in sections, as the electric plant is not powerful enough to light up the whole building. At first the eastern and the western portions of the Museum were opened on alternate week-day evenings; but the number of visitors so rapidly declined, that the galleries were afterwards further subdivided into three sections. The numbers, however, have still continued to decline. The experiment of evening opening, having thus had a fair and patient trial, will now be abandoned; and a lengthened exhibition by day will be substituted, during the months when the Museum has hitherto been closed at 4 p.m. or 5 p.m., according to the season of the year. On and after Monday, January 3, the Exhibition Galleries will be kept open throughout the year from 10 a.m. to 6 p.m. It is believed that the extension of time will be appreciated by visitors, particularly during the winter months, when hitherto the closing hour has been 4 p.m. The arrangements for opening on Sunday afternoons will not be altered; visitors being admitted at hours varying between 2 p.m. and 7 p.m., according to the season of the year.

THE severe gale of November 28 and 29, which caused such serious damage all along the south-east coast of this country, had the effect of raising the tide to an abnormal height, the tide of the following day being considerably depressed. Writing in the *Engineer*, Mr. W. H. Wheeler says the wind appears to have had the greatest effect in increasing the height of the tide along the part of the coast extending from the Humber to the east end of the English Channel. The wind on the previous days had been blowing strongly from the south-west, a condition favourable to increasing the height in the Channel; it then flew round to the north-west, a quarter which always raises the tide in the North Sea. The combined influence of the winds from these two opposite quarters would therefore tend to concentrate the full effect of the tide along the south-eastern coast, and the records of the damage done to the cliffs and in flooding, owing to the water breaking through or flowing over the banks, and doing other damage, show that this was the case. Fortunately the gale occurred five days after the new moon, or the effect would have been even more serious. The amounts by which the water at a few places rose above the proper tide-mark on Monday, November 29, are as follows:—Grimsby, 5 feet 11 inches; Hull, 5 feet 3 inches; The Wash (Boston Dock), 5 feet 3 inches; Lynn, 7 feet; Yarmouth, 8 feet; Ipswich, 6 feet 6 inches; Dover, 6 feet 1 inch; Gravesend, 3 feet 4 inches; Newhaven, 2 feet 4 inches; Portsmouth. 1 foot 8 inches.

THE last published *Annali* of the Italian Central Meteorological Office contains particulars of the activity of that department in various directions. One section deals specially with agricultural meteorology and the distribution of thunderstorms, and publishes a monthly review containing ten-day means for a considerable number of stations. A regular discussion of the mean weekly and annual frequency of thunderstorms and hail has been undertaken, and the results for some provinces have been laid before the Royal Academy. Another section deals specially with earthquakes, and the observations are regularly published in a monthly *Bulletin*. Dr. Agamennone, to whom we are indebted for many researches in this subject, has established a geodynamic observatory at Constantinople, with instruments similar to those in use at Rome. Considerable attention is paid to terrestrial magnetism, and the present volume contains an account of the absolute measurements of the different magnetic elements made in Italy in the years 1888-9. Among the purely meteorological discussions we may mention one on the anemometrical records at Vicenza for the fifteen years 1875-90. The author states that the diurnal velocity curve is far from showing the simplicity of a single diurnal wave.

THE properties of algebraic curves, classified on the basis of their gonality, have been studied by Prof. Amadeo, and a paper on the subject—the third of a series—is published in the *Rendiconto* of the Naples Academy (iii. 3a, 8-10). After dealing at length with the k-gonal curves of the first and second species, the author passes on to consider those of species s. The most noteworthy feature is the proof that a k-gonal curve of species s can be referred uniquely to a k-gonal curve of the first or second species, according as s is odd or even.

THE *Botanical Gazette* for November prints a very interesting history of the public gardens and plantations in Jamaica, contributed to the *Proceedings* of the Botanical Society of America by Mr. W. Fawcett, the Director. The first Botanic Garden in Jamaica was formed about 150 years ago by a private individual, Mr. Hinton East, on his property near the present village of Gordon Town, nine miles from Kingston. It was shortly afterwards taken over by the Government, and two gardens established, a "European" and a "Tropical." But it was only within about the last thirty years that a serious attempt was made, under Sir J. B. Grant, to make the Gardens of economic value to the Colony, during which time much has been done to determine what foreign importations are most suitable to the climate. There are now six larger or smaller Gardens, viz. the Parade, King's House, Hope, Hill, Castleton, and Bath Gardens, varying greatly in their climatal conditions. Mr. Fawcett estimates that the native flora of the island includes about 450 ferns, and 2180 species of flowering plants.

ATTENTION has been previously called in our columns to Prof. Felix Plateau's observations of the way in which flowers attract insects (*Bulletin de l'Académie Royale de Belgique*), from which he inferred that the presence or absence of brightly-coloured corollas possessed little or no influence on their insect visitors. These researches are concluded in the current number of the *Bulletin* (iii. 34). Repeated experiments on seventeen species of plants, all genuinely anemophilous, prove that it is sufficient to place on the greenish or brownish inconspicuous flowers some artificial nectar, represented by honey, in order to attract numerous insects. Moreover, it appears (both from the author's personal observations and from previous writings) that insect visits, often frequent, have been observed on ninety-one forms of entomophilous plants having flowers devoid of conspicuous colour, viz. forty-one with green, thirty-eight with greenish, and twelve with brown or brownish flowers. The author has verified the coloration for seventy-two of these plants, and has himself observed the visits of insects to sixty-three, or more than two-thirds of them. Prof. Plateau concludes that insects are little affected by the presence or absence of brilliantly coloured floral organs; what they seek is the pollen or nectar, and in finding these their sense of vision is merely accessory; while, on the other hand, they are guided with certainty by some other sense, which can only be that of smell.

AN important series of investigations has recently been published in the *Annales de l'Institut Pasteur*, by Dr. Paul Remlinger, on the artificial communication of typhoid fever by the alimentary tract. Hitherto it has been customary to infect animals with the typhoid bacillus by introducing this organism into the peritoneum, but in consequence of the attention which has lately been directed to the danger of typhoid being disseminated through the direct watering of vegetables with sewage, Dr. Remlinger experimented on the possibility of infecting rabbits and rats with typhoid by feeding them on vegetables soaked with typhoid bacilli. These experiments showed that it was possible to induce typhoid fever in rats and rabbits by this means, and Chantemesse has not only confirmed Remlinger's results, but states that he has succeeded in infecting monkeys with typhoid in a similar manner. The following experiment gives some idea of the results obtained by Remlinger in this interesting inquiry. A rabbit commenced to eat typhoid-soaked vegetables on August 30; two days later its temperature rose and later on it became thin and apathetic, and on September 7 the supply of typhoid bacilli was stopped; on September 15 symptoms of diarrhœa made their appearance, and blood taken from the animal gave a positive reaction with the sero-typhoid test; a few days later the temperature became normal, and the animal gradually recovered, but on September 30 its blood still gave a positive reaction with the above test. Experimental typhoid induced in this manner in rats resembled very closely the symptoms observed in the case of rabbits. It is, however, necessary in order successfully to infect animals with typhoid by this means, to make them frequently swallow large quantities of the bacilli.

THE number of *Isis* (Dresden) for the first half of 1897 contains a paper, by Dr. P. Menzel, on the "Tertiary Flora of the 'Jesuitengraben' at Kundratitz," a very rich layer, from which a number of new species are described. A plate accompanies the paper.

THE Report of the Director of the Botanical Survey of India for 1896-97 includes reports from all the Directors of Departments except that of Southern India. The results will shortly be dealt with of the botanical exploration, by Lieut. Pottinger, of a portion of the valley of the Irrawaddy, a country hitherto absolutely unknown. A synopsis is given of the flora of Western India as far as the Tiliaceæ.

THE Tuesday evening science lectures at the Royal Victoria Hall, Waterloo Road, during January, will be as follows:—January 4, "Coal," by Mr. W. F. Rudler; January 11, "Diamonds," by Prof. H. A. Miers, F.R.S.; January 18, "Through the New Gold Fields of Alaska to Bering Strait," by Mr. H. de Windt; January 25, "Mars as a World," by Mr. R. A. Gregory.

PHILIP'S revolving planisphere is well known to be a very handy and serviceable means for finding the constellations visible at any time. A more substantial form of the contrivance, with an adjustable calendar combined, has just been published by Messrs. George Philip and Son. The arrangement is made so that it will stand alone, or it may be hung from a wall. It is thus a suitable ornament for the astronomer's desk, or for the observatory.

THE additions to the Zoological Society's Gardens during the past week include a Mandrill (*Cynocephalus mormon*, ♂), a Mona Monkey (*Cercopithecus mona*, ♂), two Green Monkeys (*Cercopithecus callitrichus*, ♂ ♂), a —— Hawk Eagle (*Spizaetus* ——), seven African Walking Fish (*Periopthalmus koelreuteri*) from West Africa, presented by Dr. H. O. Forbes; a Sykess Monkey (*Cercopithecus albigularis*, ♂) from West Africa, pressented by Mr. Henry Curnow; a Binturong (*Arctictis binturong*) from Malacca, presented by Mr. W. W. Skeat; a Blotched Genet (*Genetta tigrina*) from South Africa, presented by Mr. J. E. Matcham; a Ruddy Ichneumon (*Herpestes smithi*) from India, presented by Colonel F. Morison; two Grey Struthideas (*Struthidia cinerea*) from Australia, presented by Mr. R. Phillipps; a Crimson-eared Waxbill (*Estrelda phœnicotis*) from West Africa, presented by Miss Aves; a Thar (*Capra jemlaica*, ♂) from the Himalayas, six White Pelicans (*Pelecanus onocrotalus*) from Egypt, deposited; three Coscoroba Swans (*Coscoroba candida*) from Antarctic America, a Macqueen's Bustard (*Houbra macqueeni*) from Western Asia, purchased.

OUR ASTRONOMICAL COLUMN.

NEW DOUBLE STARS.—The discovery of new double stars at the Royal Observatory, Cape of Good Hope, by Mr. R. T. A. Innes, is proceeding apace, and Dr. Gill publishes in *Astr. Nach.*, 3462, a fourth list of such objects. The number of stars given is twenty-nine, making the total now discovered 259. The distances of the components range in this last list from $0''\cdot5$ to $5''$.

NEW VARIABLE STARS.—More than once in this column it has been shown that useful astronomical work can be done with instruments of only moderate size, backed up by steady observation; but no one has done more to emphasise this fact than Dr. Anderson, of Edinburgh, first with his discovery of Nova Aurigæ, and later by a close scrutiny of stars to detect any variability. From observations made with his 2¼-inch refractor, he points out in *Astr. Nach.*, 3461, that a star in Aquila, not mentioned in the Bonn *Durchmusterung*, but whose position (possibly wrong to the extent of 1′) is R.A. 19h. 31m. 10s. Decl. + 11° 23′, has proved to be variable